

## REMARKS

Please cancel claims 61-106 in response to the preceding restriction requirement. Accordingly, claims 7, 54-60, and 107 remain pending.

The Examiner has objected to the drawings under 37 CFR 1.83(a) for not showing the “dummy filling” feature. It is respectfully submitted that a “dummy filling” feature is shown as element 902 in Figure 26b and element 903 in Figure 26c. These features are referred to as “dummy shapes” in the specification at page 44, last paragraph. The term “dummy shape” is used interchangeably with the term “dummy filling” throughout the specification, *e.g.*, the preceding paragraphs on page 44 use the term “dummy filling.”

The Examiner has also objected to the specification under 37 CFR 1.75(d)(1) and MPEP 8608.01(o) for failing to provide proper antecedent basis for claimed subject matter. Specifically, the Examiner asserts that the specification never discloses a defect is detected when the at least one dummy filling coupled to the test structure does not have a voltage potential that differs from a voltage potential of the other non-coupled dummy fillings as claimed in claim 58. It is submitted that the specification does disclose such claimed subject matter. At page 44, second paragraph, the specification discloses that dummy fillings can be fabricated as contacts between a metal layer under test and the substrate and a defect is detected when a contact is open since it appears dark as compared with a coupled contact which appears light (*i.e.*, emits secondary electrons). The specification also recites that some dummy shapes are coupled to contacts, while others are not, to permit voltage contrast testing at page 44, last paragraph. Also shown in Figs. 26b and 26c. Voltage contrast testing of such of structure is described in detail at page 32, 2<sup>nd</sup> paragraph through page 33, 2<sup>nd</sup> paragraph with respect to Figure 7a.)

The Examiner has rejected claims 7 and 107 under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains. It is respectfully submitted that these limitations are all described in the specification to meet the requirements of 35 U.S.C. §112, first paragraph.

### Claim 7

Specifically, the Examiner asserts that the specification never discloses “determining whether one or more empty spaces that are positioned outside the first areas require dummy fillings to facilitate an even polishing of a surface of the semiconductor die during CMP polishing; and forming a plurality of conductive layers within at least one of the empty spaces which are determined to require dummy fillings so as to form a test structure, wherein a top conductive layer of the plurality of conductive layers within the at least one of the empty spaces

which are determined to require dummy fillings includes a dummy filling coupled to the test structure as claimed in claim 7.

“Determining whether one or more empty spaces that are positioned outside the first areas require dummy fillings to facilitate an even polishing of a surface of the semiconductor die during CMP polishing” is described at page 44, 3<sup>rd</sup> paragraph, among other places, which recites:

“after the test chip is initially designed, it may be determined whether empty space requires dummy fillings to prevent defects caused by CMP polishing. Under current technology, this is often determined using software tools available in the marketplace. This determination will be based on the size and configuration of the empty space.”

This passage clearly describes what factors may be used to determine whether empty space requires dummy fillings, *i.e.*, size and configuration of the empty space.

“Forming a plurality of conductive layers within at least one of the empty spaces which are determined to require dummy fillings so as to form a test structure, wherein a top conductive layer of the plurality of conductive layers within the at least one of the empty spaces which are determined to require dummy fillings includes a dummy filling coupled to the test structure” is described at page 44, 3<sup>rd</sup> paragraph, among other places, which recites “once this determination is made, according to the present invention, the dummy fillings can be fabricated as contacts that can be tested similar to the contacts of the contact arrays described above.” Formation of such a structure is further detailed at page 44, 2<sup>nd</sup> paragraph which recites:

“In one exemplary test structure 902, a contact 904 is formed between a substrate 906 and a first metal layer portion 908 (first metal pad), and through an isolation layer 910. The first metal pad 902 may be connected to the metal filler 900 by at least one via 912 formed through a interlayer dielectric 914. This structure 902 may have more metal layers above the metal under test (MUT) and more redundant vias between these metal layers.”

Formation of such an example multi-layer voltage contrast test structure is also described at page 32, 2<sup>nd</sup> paragraph through page 33, 2<sup>nd</sup> paragraph with respect to Figure 7a, among other places.

#### Claim 107

The Examiner also states that the specification never discloses “forming a plurality of conductive layers within at least one of the empty spaces which are determined to require

dummy fillings so as to form (a first test structure and a second test structure) wherein (the first test structure is coupled with the substrate of the semiconductor die and the second test structure is not) and wherein (at least one of the dummy fillings is coupled to the first test structure and at least one of the dummy filling is coupled to the second test structure); performing voltage contrast inspection on the first and second test structures to detect a defect within the first and second test structure, wherein a defect is detected when the first test structure differs from a voltage potential of the second test structure" as claimed in claim 107. Formation of one example of such a structure is described at page 44, 2<sup>nd</sup> and last paragraph. The 2<sup>nd</sup> paragraph describe formation of a multi-layer test structure in the form of a contact coupled to a dummy filling, while (the last paragraph describes coupling such contact test structures to some of the dummy filling and leaving some dummy filling floating). (Testing of such a structure is fully described at page 32, 2<sup>nd</sup> paragraph through page 33, 2<sup>nd</sup> paragraph with respect to Figure 7a, among other places.) Different emb

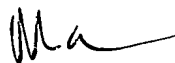
#### Claim 54

The Examiner has also stated that the specification never discloses "determining whether one or more empty spaces that are positioned outside (the first areas require dummy fillings to facilitate an even polishing of a surface of the semiconductor die during CMP polishing); and forming a plurality of dummy fillings within the empty spaces determined to require dummy fillings as claimed in claim 54." As discussed with respect to claim 7, these limitation are fully described in the specification.

The Examiner's rejections of the dependent claims are also respectfully traversed. However, to expedite prosecution, all of these claims will not be argued separately. Claims 55-60 and 107 each depend directly from independent claims claim 54 and, therefore, are respectfully submitted to be patentable over cited art for at least the reasons set forth above with respect to claim 54. Further, the dependent claims require additional elements that when considered in context of the claimed inventions further patentably distinguish the invention from the cited art.

Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,  
BEYER WEAVER & THOMAS, LLP



Mary Olynick  
Reg. 42,963

P.O. Box 778  
Berkeley, CA 94704-0778  
(510) 843-6200